

# Space News Roundup

Vol. 29

November 30, 1990

No. 47

## Cohen to receive National Space Trophy

*Award cites contributions to exploration of solar system*

By Kari Fluegel

JSC Director Aaron Cohen will receive the prestigious 1991 National Space Trophy from the Rotary National Award for Space Achievement Foundation.

Cohen will be the fifth person to receive the Rotary award. The trophy, permanently housed in the JSC Visitors Center, is presented annually

to a United States citizen in recognition of his or her preeminent contributions for space exploration.

"This is truly a great honor," Cohen said. "Past recipients of this award have long histories of dedication to excellence; I am proud to be counted in their company."

Previous recipients include Maxime Faget, former JSC Director of Engineering and currently chief

executive officer of Space Industries Inc., in 1987; former Congressman Don Fuqua in 1988; NASA Administrator Richard Truly in 1989; and Dr. Lew Allen, director of the Jet Propulsion Laboratory, in 1990.

Cohen, who has served as JSC's director since 1986, is receiving the award for his outstanding contributions to the continuation of exploration of the solar system.

The award recognizes his distinguished 28-year career with JSC. His leadership at JSC has helped make America a driving force in space exploration, said Charles Hartman, president of the Rotary National Award for Space Achievement Foundation.

The trophy will be presented at an awards banquet Feb. 28 at the Hyatt Regency Downtown in Houston.



Aaron Cohen

## Atlantis lands in Florida

By Kelly Humphries

The Space Shuttle *Atlantis* already is back in its hangar and being readied for its next flight after the first landing at Kennedy Space Center in five and a half years.

*Atlantis* completed its STS-38 mission a day late on KSC's Runway 33 at 3:42 p.m. CST Nov. 20 after strong winds forced wave-offs from Edwards Air Force Base in California.

Commander Dick Covey, Pilot Frank Culbertson and Mission Specialists Sam Gemar, Carl Meade and Bob Springer—and their families, who had been in California—returned home to JSC shortly after 10 p.m. that night and were greeted by several hundred co-workers, friends and family.

*Atlantis'* spectacular launch from Pad 39A at 5:48 p.m. CST Nov. 15 lit the night sky and allowed spectators to see *Atlantis'* climb for about seven minutes.

The orbiter performed almost flawlessly during the 4 day, 21 hour and 54 minute Department of Defense-dedicated flight. A hydraulic coolant controller malfunctioned during ascent, an electrical problem stopped use of the vacuum cleaner on orbit and there were several instrumentation glitches, but there were no serious problems.

The landing at KSC's Shuttle Landing Facility was the first since STS-51D in April 1985, when Commander Karol Bobko set down on the same runway. Since that landing, which ended with a blown tire and extensive brake damage, the



JSC Photo by Bob Walck

Mission Specialist Carl Meade gets a big welcome home hug from his son, David James, at Ellington Field.

ends of the runway have been smoothed for touchdown and shuttle brakes have been beefed up.

William Lenoir, NASA associate administrator for space flight, said he had no qualms about approving the landing on KSC's concrete runway and will do so again if the weather is better at the Cape than at Edwards. Regularly scheduled landings at KSC are probably a year and a half away, he said, and even then the unpredictable Florida weather will allow only half of the landings to take place there.

"We would like to get a little bit more

characterization of our handling qualities," he explained, "we have some tests we would like to do on landing roll out in subsequent missions that are better suited on a lakebed where you have more latitude."

KSC Director Forrest McCartney said the landing posed no especially difficult problems for the preparation teams because KSC has been the secondary landing site for the past several missions.

Elimination of the ferry flight from  
Please see **ATLANTIS**, Page 4

## Columbia launch set for Sunday; Astro-1 ready

By James Hartsfield

Months of work to locate and repair elusive hydrogen leaks should bear fruit shortly after midnight Sunday when *Columbia* lifts off on STS-35, its second flight of the year.

Shuttle managers set 12:28 a.m. CST as the opening of the 2-hour, 30-minute launch window following a brief flight readiness review at the Kennedy Space Center on Tuesday.

"The shuttle team has worked very hard to get *Columbia* ready to fly," Space Shuttle Director Robert Crippen said after the meeting. "With the hydrogen leak resolved, we are ready to end the year with the Astro-1 mission which will extend our knowledge of the universe."

This will be the fourth launch attempt for *Columbia* this year, with three previous attempts—on May 29, Sept. 6 and Sept. 18—scrubbed due to hydrogen leaks. However, replacement of the orbiter's 17-inch disconnect during the summer and the work of a special investigation team this fall resulted in a hydrogen tanking test last month that showed no excessive leakage.

*Columbia's* crew—Commander Vance Brand, Pilot Guy Gardner, Mission Specialists Mike Lounge, Jeff Hoffman, Bob Parker, and Payload Specialists Ron Parise and Sam Durrance—left Houston Thursday evening for KSC. Split into two in-flight teams, the crew will perform scientific obser-

vations with the Astro ultraviolet and X-ray observatory around the clock during the 9-day, 21-hour mission. As planned, the shuttle flight will be the second longest in history. *Columbia* is currently scheduled to land at Edwards Air Force Base, Calif., at 10:26 p.m. CST Dec. 11.

*Columbia's* countdown began at midnight Thursday, and early weather forecasts indicated a high likelihood of an on-time launch.

JSC's lead flight director for STS-35 is Gary Coen. Wayne Hale will be in charge of the ascent and entry flight control teams; Coen will be in charge of the Orbit 1 team; Al

Pennington will supervise the Orbit 2 team; and Bob Castle will be the Orbit 3 flight director.

Meanwhile, in the Orbiter Processing Facility's (OPF's) Bay 1 at Kennedy, *Discovery's* three main engines were installed this week. Also, seals were replaced in the orbiter's freon cooling system, and a newly developed test of the Orbital Maneuvering System fuel tank screens is under way in KSC's Hypergolic Maintenance Facility. *Discovery* is being readied for STS-39, scheduled for a late February 1991 launch.

*Atlantis*, fresh from space on STS-38, is in the OPF's Bay 2. This week, the pyrotechnic devices on the spacecraft were safed, residual fuel was removed from the OMS tanks and routine post-flight inspections were begun.



**STS-35**  
Astro-1

## Missed opportunities

Hubble Space Telescope manufacturer, NASA share blame for problem

By Kelly Humphries

The manufacturer of the Hubble Space Telescope missed three opportunities to correct the problem in the telescope's less-than-perfect primary mirror, Optical Investigation Board Chairman Lew Allen said Monday, but NASA management must share the blame.

The investigating team concluded that Perkin-Elmer Corp., now Hughes-Danforth Optical Systems, relied on tests with a single instrument when it ground the 94.5 inch-diameter mirror to precisely the wrong shape 10 years ago.

Reliance on the faulty instrument, called a reflective null corrector, resulted in a spherical aberration that has restricted HST's ability to see very faint and very low contrast objects, one of its primary objectives. A procedural error in how a spacing measurement was made caused the instrument to be about three ten-thousandths of an inch off.

"Why wasn't it detected prior to launch? The answer to that question is not a particularly happy one," said Allen, director of NASA's Jet Propulsion Laboratory. "There were at least three

cases where there was clear evidence that a problem was developed and it was missed all three times."

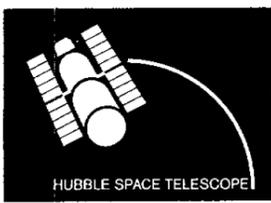
Revealing data from two other instruments—a refractive null corrector and an inverse null corrector—were ignored by mirror-grinding technicians because the reflective null corrector was the only certified instrument, he said.

Nevertheless, Allen said blame belonged equally to Perkin-Elmer and to NASA.

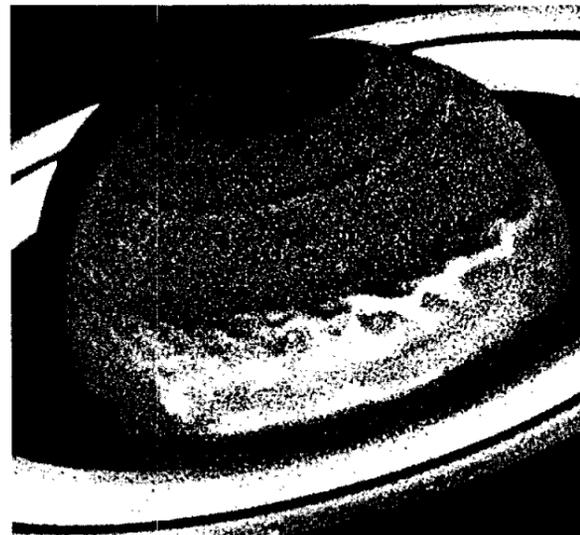
Perkin-Elmer management was not made aware of the flaw because its Optical Operations Division did not share its concerns about conflicting test data, Allen said. Also, top management's attention was focused on severe cost and schedule problems instead of fabrication.

NASA's quality assurance representatives verified the measurement procedure, but were not allowed to personally inspect some measurements because of the danger of mirror contamination, he said. Those representatives were not optics experts and probably wouldn't have caught the problem anyway, he added.

Please see **HUBBLE**, Page 4



HUBBLE SPACE TELESCOPE



NASA Photo

Even with its spherical aberration, the Hubble Space Telescope continues to return photos better than any made by Earth-bound telescopes. This photo shows the new "Great White Spot" near the equator of Saturn.

JSC

# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): \$3.75 each.

AMC Theater (valid until May 1991): \$3.50 each.

Dickens on the Strand: (Dec. 1-2, Galveston): child (6-12), \$2; adult, \$4; seniors, \$2.

Christmas Dance (7 p.m. Dec. 8, Gilruth Center, music by Kendrix and the Sterling Silver Band): Dec. 8, prime rib, \$15.

FBA Memberships and coupon books are now available—\$1 off civil servant's first book.

Business cards can be ordered by civil servants in Bldg. 11, 250 cards per set. Old logo, \$21; new logo, \$18.

Nutcracker: (8 p.m. Dec. 7-8, 2 p.m. Dec. 8-9, UHCL Bayou Theatre, UHCL Metropolitan Ballet): \$7.

JSC

# Gilruth Center News

**Sign up policy**—All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance.

**EAA badges**—Dependents and spouses may apply for a photo I.D. 6:30-9 p.m. Monday-Friday.

**Defensive driving**—Course is offered from 8 a.m.-5 p.m., Jan. 12 and Jan. 26. Cost is \$15.

**Aerobics and exercise**—Both classes are on-going.

**Country and western**—Next dance class begins Jan. 7 for beginners and intermediate. The six-week class meets Mondays, beginner at 7:15 p.m. and intermediate at 8:30 p.m. Cost is \$20 per couple.

**Health Related Fitness Program**—Includes screening by medical examination and a 12-week education component. For more information call the Physical Fitness Office at x30301.

**Volleyball sign-ups**—registration will be Dec. 11. This season will consist of Monday, Tuesday and Friday night games.

**Basketball sign-up**—registration will be Dec. 12. This season, there will be Wednesday Mens B, Thursday Mens C and Saturday Mixed leagues.

**Soccer sign-up**—Registration will be Dec. 13. This season will consist of Saturday mixed leagues. Non-badged teams may register Dec. 14.

JSC

# Swap Shop

Property

Rent Heritage Park, room w/phone, fully furn. 3 BR house, \$200/mo. plus 1/3 util. avail in Jan. Jay, x35814 or 992-3149.

Sale: Merritt Isl., FL, near KSC, 5-3-2 on 2.5 acres, zoned for horses, \$139K. 538-2299.

Lease: CLC area, condo 2-1, FPL, all appl., miniblinds, W/D conn., storage, swimming pool, \$450/mo. 486-0315.

Sale: Lake Travis, 1.5 lots, panoramic hilltop view, \$10K. Anna, x31138 or 332-4383.

Vacation Rental: Lake Livingston, waterfront, 3-2, CA/H, FPL, covered deck, pier, fully furn., wk/wknd. 482-1582.

Sale: 3-2-2 brick, LC-Brittany Bay, FPL, lg. master bath, \$74,950. David, 554-5514.

Lease: El Lago lakeview, 2-1, util. incl., 5 min. from JSC, \$550/mo. x32883.

Sale: Orlando, FL, retirement home, 2-2, den, Florida rm, fully furn., \$49,900. 280-2523 or 333-1762.

Sale: 2-2-2, guest quarters, 1.5 acres, satellite, near Santa Fe, \$69,900. 282-2667 or (409) 925-8593.

Rent: Baywind I, 1 BR condo, new carpet & paint, ex. cond., avail. Dec. 1, \$395/mo. 480-9280.

Rent: 3-1.5, 1,500 sq ft, \$550/mo. Steve, x32682 or 922-1978.

Sale: Kerrville, TX, 12'x60' mobile home, furn., good cond., lg. carport, patio, \$7,500. 333-6150 or 326-1254.

Sale: Hot Spring Village, ARK, wooded lot, util., \$13K OBO. 326-1254 or 333-6150.

Rent: CLC Camino South, 3-2-2, FPL, fenced, trees, 750/ mo. John or Pat, 667-5751.

Sale: 1.52 ac. Alvin Country Club area, some improvements, \$16K. 480-4088.

Lease: Galveston condo, 2-1, FPL, all appliances, 69th Street, \$550/mo., one year lease. 488-2664.

Lease: Pipers Meadow, 3-2-2, FPL, fenced, ceiling fans, year lease, dep. plus \$750/mo., avail. Dec. 1, no pets. Susan, 488-9020 or 480-6446.

Rent: Webster/Ellington, 2-1 apt., many extras, \$425/mo. Dave, x38156 or Herb, x38161.

Sale: Bay Glen 2 story, 3-2-2, cul-de-sac, shutters, alarm sys., \$122.9K. x39230 or 486-7106.

Lease: Egret Bay, 1-1-2, covered parking, FPL, fans, no pets, \$450/mo. plus dep. 333-6729 or 486-9876.

Sale: Galveston vacation resort/limeshare, \$12.5K (409) 938-3171.

Lease: Baywind II condo, 2-2, upstairs, W/D, FPL, updated carpet, \$475/mo. plus dep. x32168 or 338-2851.

Sale: Pipers Meadow, 3-2-2, formal LR/DR, FPL, loft, wet bar, fans, new paint, 10% assum., \$92K. Dennis, x34405 or 480-5076.

Sale: Univ. Green townhouse, 3-2-2, fans, FPL, whirlpool tub, loft, alarm sys., \$92K. Dennis, x34405 or 480-5076.

Rent: Galveston condo, furn., sleeps 6, Sea Wall Blvd. & 61st St., dly/wkly/wknd rates. Magdi Yassa, x33479 or 486-0788.

Rent: Pagosa Springs, CO, 2-2 house sleeps 8, Jacuzzi, loaded, ski Wolf Creek and Purgatory, 5 Jan-20 Apr 91, 1 wk, \$580. Scott, x34614 or 334-2278.

Sale: Univ. Green, 2-1-2, patio home, fenced, new paint, vaulted ceiling, miniblinds, custom drapes, fans, FPL, deck, \$76K. 480-7338.

Sale: Seabrook townhouse, 3-2-2-2C, 1400 sq ft, fenced patio, \$22K. OBO. 333-7345 or 474-2339.

Sale: 60 acres on Hwy 80, 3 mi from Karnes City, TX, 50 mi. from San Antonio; El Campo, TX, 2-story house on 1.5 lots w/fruit trees. 783-9164.

Rent: 1 BR apt., all util., balcony, alarm, covered parking, \$395/mo. Steve, x36623 or 332-8639.

Sale: Seabrook bayfront lot, \$125K; two water view lots near NASA, \$38.5K/ea. Don, x38039 or 333-1751.

Sale: Oak Brook 4-2-5-2, new carpet, backs up to golf course, \$98K. 480-4502.

Lease: CLC condo, 2-1, FPL, blinds, all appl., fenced patio, pools, \$450/mo. 486-0315.

Lease: Galveston Bay waterfront, 2-2, block paneling, wood floors, decked, fenced, hot tub, \$1,200/mo. 333-6277 or 339-3562.

Sale: Baylor condo, 1 BR, furn., ex. cond., tax deductible, nego. 334-3896.

Lease: LC Countryside, 3-2-2, FPL, fan, fenced, no pets, \$725/mo. plus dep. 486-9811.

Cars &amp; Trucks

'67 Pontiac Catalina V8, needs ball joints, \$350. 488-6621.

'77 Grand Prix, new trans./tires/radiator, \$1,495. OBO. David, 554-5514 or 282-3827.

'68 Chevelle, 6-cylinder, 100K mi., runs well, \$1K. OBO. Ed, 283-5716 or 333-1563.

'87 Trans Am, 31K mi., loaded, ex. cond., \$10K. 486-4909.

'87 Chev. Cavalier, 4-dr., auto, 37K mi., ex. cond., \$4,500. OBO. Dave, x39579 or 482-6187.

'67 Dodge Charger 440, new int., reb. eng., good cond., \$3K. 474-7234.

'82 GMC Starcraft custom van, loaded, ex. cond., 84K mi., \$6,400. Howard, x31254 or 474-3384.

'84 Cad El Dorado, ex. cond., \$5,900. Howard, x31254 or 474-3384.

'85 Merc-Benz, 300-D turbo, all options, \$15,995. 480-4088.

'76 Mercedes 300D, sunroof, all pwr., \$2,850; Big Foot 4WD Chevy truck, \$2K. OBO. Jerry, x39287.

'86 Hyundai Excel, 4-cr., hitch, 5-spd, 93K mi., ex. cond., \$3,400. 485-4932.

'89 Firebird, 13K mi., 12 mo. tuneup warr., \$9,700. Carrie, x38506 or 333-4089.

'87 BMW 325, 2-dr., 5-spd., ex. cond., serv. rec., \$12K. Phil, x33283 or 353-0108.

'90 Jeep Wrangler, WH/BL, man. trans., 4K mi. Julie, x35724 or 482-3134.

'85 Buick Electra Park Ave., auto, 70K mi., ex. cond., \$6,300. David, 334-2766.

'81 Monte Carlo, V8, auto, 78K mi., ex. cond., \$2,800. x39216 or 482-5197.

'83 Chevy Malibu Classic, good cond., 101K mi., new tires/batt., BO. 333-6647 or 286-1032.

'88 Ford Mustang LX, 2.3L, 5-spd., 27K mi., \$6,500. x32567 or 488-3314.

'83 Plymouth Turismo, 2-dr. hatch, ex. cond., 61K mi., 5-spd., \$2,900. OBO. Dennis, x34405 or 480-5076.

'78 Toyota Corolla, needs some work, \$800. OBO. Ellen, 333-7861 or 538-1621.

'89 Honda CRX Si, 5-sp., sunroof, ex. cond., \$9,300. x38088.

'77 Dodge Royal Monaco, reliable, serv. rec., \$800. OBO. Gene, x38020 or 334-1505.

'88 Ford T-Bird TC, std., clean, 27K mi., \$10,300. Rich, 480-2570.

'83 Mercury Cougar, 2-dr., loaded, \$4K. OBO. 333-7853 or 337-6131.

'86 Ford Aerostar van, V6, fuel inj. w/OD, ex. cond., \$4,800. 488-1320.

'85 Chevy S-10 Blazer, 4WD, 125K mi., Tahoe pkg., \$4K. x30962.

'90 Eagle Talon TSi Turbo, loaded, ex. cond., 8,500 mi., \$13,800. OBO. 282-3242 or 286-3631.

'84 Silverado Blazer, auto., 4WD, 6.2 liter diesel, loaded, ex. cond., \$3,800. 338-2851.

'85 Chevy S-10 Blazer, V6, auto., good tires, clean, 63K mi., \$5,900. x31913 or 486-9488.

'87 Grand Am, auto., 4-dr., low mi., \$5,975. x36252 or 358-9598.

'73 GMC Sierra 3/4 ton truck, 454 eng., AC, camper, \$1,800. OBO. x37467 or 486-4043.

Cycles

2 childrens Schwinn Varsity 10-spd. bikes, good cond., \$60/ea. or \$100/both. x38947.

'82 Yamaha 1100 Maxim, 12K mi., new speed rated tires/batt., \$1,050. OBO. Darrell, 280-7724.

Old 10-spd., well weathered but works, needs new tires, BO. Kan, x38649.

'79 Honda XL500, 8K mi., ex. cond., reliable, \$700. OBO. Wally, x36440 or 326-2664.

'81 Suzuki GS450 cafe motorcycle w/spare tire, \$500. Jim, 585-0679.

Boats &amp; Planes

Aircraft propeller-Sensenich 74DM6-0-58, fits some Beech, Piper series, \$900. 538-2299.

'83 27' Chapparral w/trlr, full head/galley, AC, new VHF/DF/Loran, sleeps 6, \$23K. OBO. x31833 or 534-6073.

'86 18' Bayliner Cobra ski boat, 125hp OB, ex. cond., \$5,500. Jay, 280-4275 or 487-7930.

16' V-hull w/trlr., 165hp Merc/covered. 943-3305.

15' Fabglass Trihull, walk thru, 65hp Mercury OB, Sportsman trlr., BO. x31292 or 488-5610.

Audiovisual &amp; Computers

IBM PC-AT 286, 640K RAM mem., 1.2 meg & 1.44 meg floppy, 30 meg HD. EGA color monitor, 287 math co-roc., Panasonic printer, Logitech Mouse, \$1,700; Apple IIe computer w/monitor, numeric key pad, joy stick, \$190. Jay, x35814 or 992-3149.

Cerwin-Vega HED-15 spkrs., \$300/pr.; Phase Linear pwr. amp., \$350. Frank, x33573 or 480-9376.

Zenith AT compat., 286 CPU, 8 MHz, 1 MB RAM, math coproc., 20 M HD, 2 FD, EGA card, EGA monochrome monitor, \$1K; PC access, Skyscan 4" scanner and OCR, \$90; Epson LQ dot matrix printer, new ribbon, \$250; 1200 baud ext. modem, \$40; IMSL Magician graphics SW, \$30. x37137 or 482-8966.

Commodore 128D w/built in 1571 disk drive, Commodore 1526 printer, Roland DG color monitor, modem, manuals, SW, \$550. John, x38429 or 482-6536.

Apple IIe, 2 drives, Comrex II printer, SW, \$800. x37435 or 280-8249.

Macintosh 512 Enhanced, 800K drive, \$550. 280-8796.

IBM XT computer, 640K mem., 30 MB HD, 2 floppies,

Today

**Software reuse program**—JSC's Software Reuse and Reengineering Working Group and the Software Engineering Professional Education Center will present a reuse and design recovery program at 8 a.m. Nov. 30 at the Gilruth Center. Demonstrations begin at 1 p.m. in Bldg. 12 and require registration with Jane Kremer at x32601.

**Cafeteria menu**—Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables: green beans, buttered broccoli, whipped potatoes.

Saturday

**SHPE run**—The Society of Hispanic Professional Engineers will host a benefit "S.H.A.P.E.-Up Run" at 8 a.m. Dec. 1 at Nassau Bay City Park. T-shirts will be given to the first 500 entrants in the 5K and first 50 participants in the 1K run; awards will be given to the top finishers. Forms are available at the Gilruth Center. For more information or to volunteer, call Linda Barrows, 333-9422, or Bob Duzan, 487-2383.

Monday

**Cafeteria menu**—Special: breaded cutlet. Entrees: beef chop suey, Polish sausage with potato salad. Soup: French onion. Vegetables: okra and tomatoes, green peas.

Tuesday

**Simulation program**—JSC and the Software Engineering Professional Education Center will present a seminar on real-time simulation at 8:30 a.m. Dec. 4 in the University of Houston-Clear Lake's Bayou Bldg. Rm. 1-311. Registration is \$35 per person. For more information, call SEPEC at 282-2223.

**Cafeteria menu**—Special: fried chicken. Entrees: Salisbury steak, shrimp Creole. Soup: split pea. Vegetables: mixed vegetables, beets, whipped potatoes.

Wednesday

**IEEE video conference**—The IEEE Galveston Bay Section will present a fiber optics applications video conference at 10:30 a.m. Dec. 5 in the Gilruth Center. Registration deadline is Nov. 30. For more information, call Andy Lindberg, x31474.

**Computer security workshop**—JSC and the Software Engineering Professional Education Center are sponsoring a computer security, integrity and assurance workshop at 8:30 a.m. Dec. 5 in UHCL's Bayou Bldg., Rm. 2-504. Cost is \$95 per person. Civil servants should call Human Resources' Jane Kremer at x32601. For more information, call SEPEC at 282-2223.

**Cafeteria menu**—Special: stuffed bell pepper. Entrees: fried catfish with hush puppies, braised beef rib, barbecue plate, wieners and beans, shrimp salad. Soup: seafood gumbo.

Vegetables: corn O'Brian, rice, Italian green beans.

Thursday

**Cafeteria menu**—Special: barbecue smoked link. Entrees: beef stroganoff, turkey and dressing. Soup: chicken noodle. Vegetables: Lima beans, buttered squash, Spanish rice.

Dec. 7

**Cafeteria menu**—Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables: green beans, buttered broccoli, whipped potatoes.

Dec. 12

**Women's Holiday Party**—A JSC Women's Holiday Party will be held at 5 p.m. Dec. 12 in the Gilruth Center. The party will include dinner and entertainment. Deadline for tickets is Dec. 5. For more information contact your directorate secretary.

Dec. 13

**AIAA meets**—The American Institute of Aeronautics and Astronautics will meet at 5:30 p.m. Dec. 13 at the Gilruth Center. John Young, special assistant to JSC Director Aaron Cohen for engineering, operations and safety, will speak. Tickets are \$9 for members, \$12 for non-members and \$8 for students/young members. Reservation deadline is noon Dec. 10. For more information call 333-6064, 283-6000, 283-4214 or 282-3160.

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Rent: Pagosa Springs, CO, 2-2 house sleeps 8, Jacuzzi, loaded, ski Wolf Creek and Purgatory, 5 Jan-20 Apr 91, 1 wk, \$580. Scott, x34614 or 334-2278.

Sale: Univ. Green, 2-1-2, patio home, fenced, new paint, vaulted ceiling, minib

# New SCA lands in NASA fleet

**A** new Shuttle Carrier Aircraft winged its way into the NASA fleet last week as the modified Boeing 747 flew from Wichita, Kan., to Ellington Field en route to its home in El Paso.

Christened NASA 911, the new SCA was delivered to NASA Nov. 20 at Boeing Military Airplanes facilities in Wichita. It was then transported, via Houston, to El Paso International Airport where it will be permanently based.

During welcoming ceremonies at Ellington, SCA Pilot Joe Algranti presented plaques to previous SCA project managers Dave Finney and Bill Readdy in recognition of their support of the second SCA project. He also presented an Orbiter Ferry Operations group achievement award to L.E. "Skip" Guidry, chief 747 flight engineer.

NASA 911 joins its sister ship, NASA 905 which has ferried all the space shuttle orbiters from California to Florida since the inception of the shuttle program. However, an additional carrier aircraft improves system reliability and eliminates a single point failure from the program, said Don Puddy, director of JSC Flight Crew Operations.

Before joining the NASA fleet, the 747 served as a domestic passenger aircraft for Japan Air Lines. Boeing acquired the aircraft for NASA in 1988, and modifications were begun.

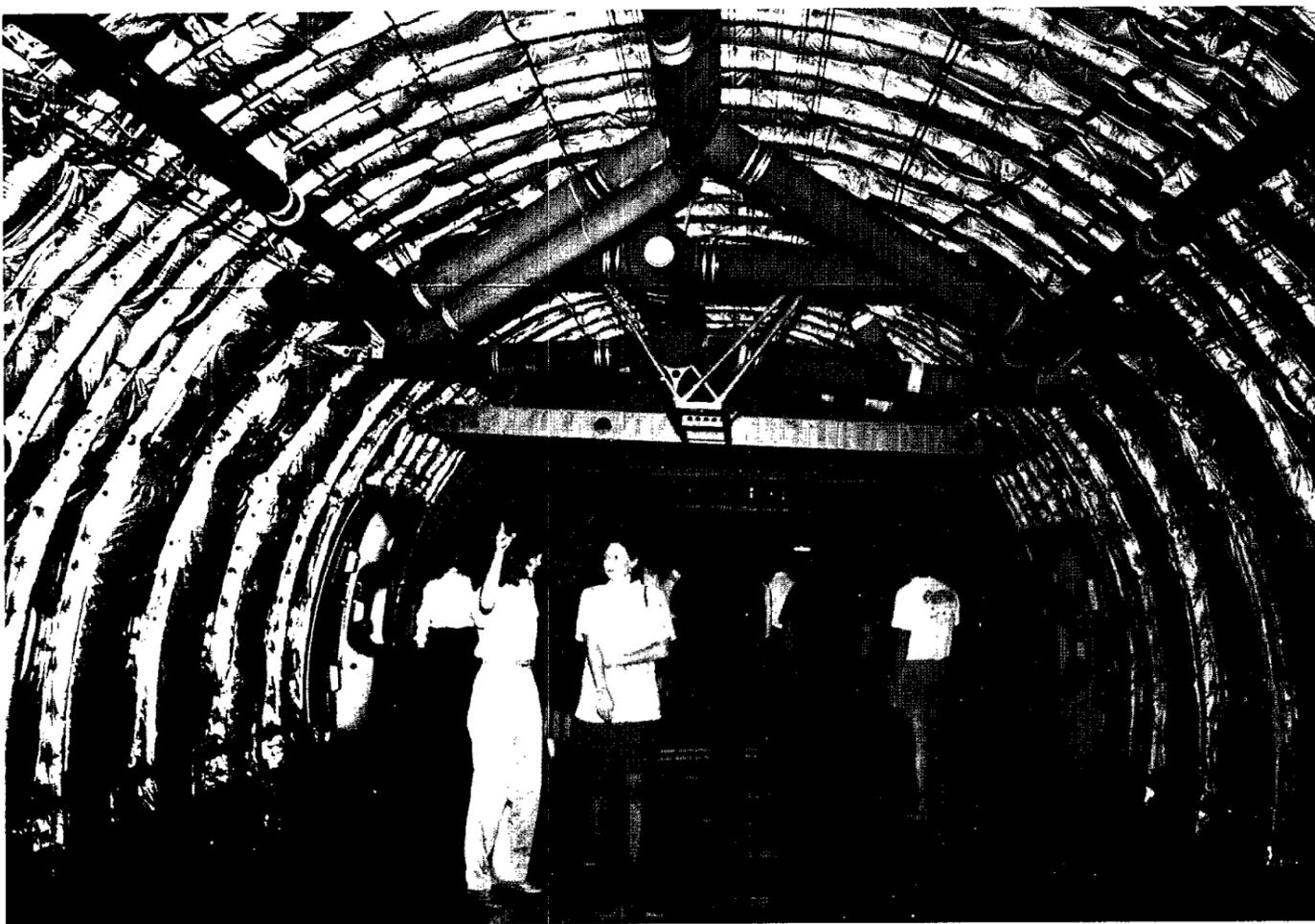
The SCA is a heavy, wide-bodied, swept-wing turbo jet powered by four Pratt and Whitney engines. The SCA is distinguished by three struts protruding from the top of the fuselage for mating of the space shuttle orbiters. Structural bulkheads were installed and the fuselage skin reinforced for support of the attachment struts. Two vertical stabilizers also were added to enhance directional stability, and all interior furnishings and equipment aft of the forward doors have been removed.

Wingspan of the aircraft is 195 feet 8 inches, with an overall aircraft length of 231 feet 10 inches. The aircraft has a maximum landing weight of 600,000 pounds and travels at a maximum air speed of 0.6 Mach.

When mated with an orbiter, NASA 911 cruises from 13,000 to 15,000 feet, but can increase its altitude to a cruising level of 24,000 to 26,000 feet when unmated. It has a range of 1,000 nautical miles when mated and 5,500 when not mated.

**Above:** The newest addition to the NASA aircraft fleet, NASA 911, lands at Ellington Field on its first visit to Houston. **Center:** Visitors inspect the inner supports added to the fuselage of the Boeing 747 during its conversion to a Shuttle Carrier Aircraft. **Lower left:** Ben Benham, Southwest Services manager, greets SCA Pilot Joe Algranti and other flight crew members on their arrival to Ellington. **Flight crew members are, from bottom to top, Arthur C. "Ace" Beall, L.E. "Skip" Guidry and Larry R. LaRose.** **Lower right:** Visitors enter the aircraft during an open house during the SCA's stop in Houston.

JSC photos by Kim Murray and Benny Benavides.



# JSC gives 106% to Combined Federal Campaign

JSC's employees donated \$372,426.24 to this year's Combined Federal Campaign, boosting the grand total to 106 percent of the \$350,000 goal.

All but five organizations gave more than 100 percent of their 1990 goals.

Employees contributed \$57,426 more than they had in 1989, including 396 employees who gave one hour's pay per month and 57 who gave two

hours' pay per month.

The offices that topped their goals by the most were the Office of the Director, with \$4,271 or 267 percent of its goal; the Space Shuttle Program Office, with \$3,590 or 205 percent of its goal; the Space Station *Freedom* Program and Operations Office with \$2,205 or 157 percent of its goal; and the Human Resources Office, with \$8,121 or 156 percent of its goal.

The Engineering Directorate con-

tributed the largest dollar amount, with \$87,787 or 106.8 percent of its goal. The Mission Operations Directorate gave the next largest amount, \$65,968 or 111.4 percent of its goal.

A total of 2,847 out of 3,584 civil service employees participated. The Office of the Director, Equal Opportunity Programs Office, Legal Office, the Office of the Inspector General and New Initiatives Office all reported 100 percent or more participation.

JSC employees at the White Sands Test Facility contributed \$3,333 to the Sun Country CFC and had 64 percent participation.

Cinda Chullen of Engineering's Management Support Office and John Saiz of the Structures and Mechanics Division won free airline tickets to anywhere in the United States.

JSC Deputy Director P.J. Weitz, who served as this year's Texas Gulf

Coast Combined Federal Campaign chairman, drew their names from those of 453 eligible contributors who gave one or two hours' pay per month.

Although the CFC officially closed Nov. 13, contributions will continue to be accepted, said CFC Coordinator Teresa Sullivan. Anyone who still wishes to donate should contact the JSC Exchange Operations Office at x39168.

## Employees earn Space Act Awards

Twenty-three JSC civil servants and contractors recently received Space Act Awards for their patents and inventions.

Space Act Awards are presented periodically to individuals for patents and inventions, Tech Briefs and other scientific and technical contributions.

The most recent awards went to Frederic S. Dawn and Joseph J. Kosmo, "Tapered Tubular Polyester Fabric;" Jimmy D. Bradley, "Power Saw;" Richard L. Sauer, "Biofilm Monitoring Coupon System;" Hatice S. Cullingford, "Method and Apparatus for Bio-Regenerative Life Support System;" William D. Harwell and Mitchell B. Wu, "Magnetic Attachment Mechanism;" Clifford W. Hess and Larry C.H. Li, "Method and Apparatus for Positioning a Robotic End Effector;" Timothy E. Fisher and Richard D. Juday, "Programmable Remapper for Image Processing;" and Michelle A. Rucker and Joel M. Stoltzfus, "High-Pressure Promoted Combustion Chamber."

Recognized for the "Payload Trainer" were Ronald A. Weitenhagen and Neil W. King, of the Training Division; James J. Kirby, Tracy Minish, and Tommy Flanagan, all of Rockwell Space Operations Company; Michael Jones, Toni Grubbs, and Mike Fuller, all of UNYSIS; and Buddy Wood of Mitre Corp.

Also, Gerald R. Taylor was recognized for the patent application of "Portable/Bedside Retinal Digital Image Analysis System."

## Mission Control viewing hours set

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during STS-35.

Based on a Dec. 2 launch, employees will be allowed to visit the MCC from 11 a.m.-2 p.m. and 5-7 p.m. Dec. 3, 5, 7 and 10. Visits will be allowed from 11 a.m.-2 p.m. Dec. 4 and Dec. 6, and from 1-5 p.m. Dec. 8 and 9.

Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30. Children under the age of 5 will not be permitted.

Special cafeteria hours have been set for the mission as well. The Bldg. 3 cafeteria will be open from 7 a.m.-4:30 p.m. launch day and weekdays, and from 11 a.m.-4:30 p.m. weekends. Bldg. 11 will be open from 6:30-2 p.m. weekdays and 7-10 a.m. weekends after launch day.

## Address correction

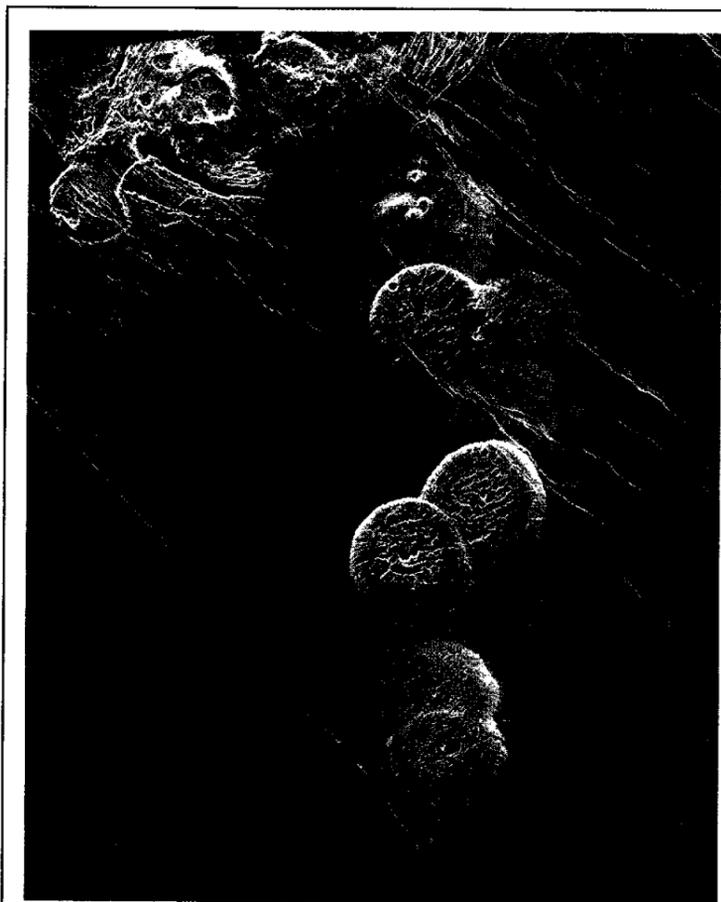
An article in the Oct. 26 Space News Roundup listed an incorrect mailing address for the National Advisory Committee for Aeronautics reunion committee. NACA alumni were encouraged to send their current mailing addresses to that post office box. The correct address is Guy Thibodeau, P.O. Box 580629, Houston, TX, 77258.

## Sometimes it's OK to act like Scrooge

Scrooge has a bad reputation, but there are times during the holidays when anxiety, depression or stress are appropriate, according to the Employee Assistance Program.

Dr. Gerald Busch will talk about ways to handle the emotional side of the holidays in a brown-bag luncheon at 11:30 a.m. Thursday in the Bldg. 30 Auditorium.

The "Feeling Like a Scrooge" program also will review the distinction between appropriate emotional experiences and more serious conditions.



**LAVA DOMES**—Magellan continues to return spectacular images of Venus' surface. This radar image shows seven pancake-like circular domical hills averaging 15 miles in diameter with maximum heights of 2,475 feet. Scientists believe they are thick eruptions of lava coming from a vent on relatively level ground, and may be analogous to volcanic domes on Earth. So far, 416.2 orbits of radar image data have been received on Earth.

NASA Photo

# Atlantis crew extends thanks families, co-workers

(Continued from Page 1)  
from California will save six to eight days in *Atlantis*' processing flow.

"Everybody that's watched this flight from the media side probably thinks the flight began and ended in Florida," Covey said at the Ellington Field welcome home ceremony. "But we all know on the crew that this flight really began and ended here in Houston with our friends and families and co-workers that have supported us and

have been so important in making this all happen for us."

Because the flight was classified, the crew gave no details of its mission but Covey expressed hope for the future. He and other crew members said putting together the NASA and national defense aspects of their careers was especially gratifying.

"One of these days maybe we'll be able to tell you about Dick and Frank and Carl and Bob and Sam's excellent

adventure," he said.

"Spaceflight is very complex and very difficult," said Culbertson, who had just made his first space flight. "The people who spend a lot of time in each of their areas of expertise to prepare us made us better at it and gave us the confidence to get our job done."

"I'm grateful to the technicians, engineers and scientists in the agency that have allowed me to come home safely after an incredible journey to

share a new lifetime together with a newborn son," said Gemar, whose wife, Char, gave birth to a baby boy, Grant, this week.

Meade offered "special thanks to our world's greatest training crew, I know what a hard job you guys had," and Springer extended those feelings to everyone who worked on the mission.

"It's the people of this program who really make it work and who make the difference in all of this," Springer said.

# Hubble's trouble not fixed because of poor communication

(Continued from Page 1)  
"Perkin-Elmer should not have allowed a situation that inhibited communications to exist," Allen said. "NASA had every right to expect that Perkin-Elmer would have done a better job with this. They had competency and experience in optics and NASA should have expected more professional performance than they actually got."

On the other hand, he said, "It is

fundamentally NASA's responsibility as a government agency to get this done. NASA should have been aware of what was happening at Perkin-Elmer."

Allen said NASA and Perkin-Elmer review boards did not penetrate deeply enough into the fabrication process.

Allen said Lennard Fisk, NASA associate administrator for space science and applications, had asked him to make sure similar problems do

not now exist in the Advanced X-Ray Astronomical Facility, which also will use precision mirrors. He found that NASA communication improvements instituted since the *Challenger* accident investigation have mitigated the problems in the AXAF program.

NASA plans to send shuttle astronauts to replace the Wide Field/Planetary Camera with a second generation camera that will correct for the effects of the spherical

aberration in 1993. The cost of repairs will be about \$50 million, he estimated.

Fisk said he is certain Hubble's problems, which also include solar panels that shake the telescope whenever it passes between sunlight and darkness, can be fixed by visiting astronauts.

"Even with this spherical aberration, Hubble is unsurpassed in its capability as an optical telescope," Fisk said.

## Expo will showcase hypermedia

Hypermedia Expo '90 will showcase the talents and contributions of the field's leaders, and its application to aerospace, science and technology Dec. 3-5.

The expo, from 8 a.m.-5 p.m. each day at the South Shore Harbour Resort and Conference Center, is sponsored by JSC, the University of Houston-Clear Lake and the Hypermedia Working Group.

Hypermedia combines information from different sources into one source: the computer. The idea is to increase the availability of audio and visual information via a friendly, speedy user interface and a wide range of tools, including interactive video and voice recognition.

Among the JSC groups investigating the application of hypermedia to space flight is the Life Sciences Project Division. The division's Hypermedia Development Lab is working on an on-line help system called Life Sciences Interactive Information Recall.

On Space Station *Freedom*, the information might be packed into a portable computer that could be velcroed to any surface. The LSIR system also could help office and support personnel in the LSPD during mission integration testing and day-to-day work.

Conference cost ranges from \$60 for students to \$175 for industry. Call 282-2223 for more information.

## Space News Roundup

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Editor . . . . . Kelly Humphries  
Associate Editors . . . Pam Alloway  
Kari Fluegel

## Classes offered at JSC

JSC is working with the University of Houston and Rice University to bring graduate engineering classes on site.

In January, JSC and Rice will inaugurate a new joint venture that makes classes available to employees via on-site television. Offered through the Rice Institute for Continuing Education in Engineering program, the classes will be broadcast from a campus television studio to a designated conference room at JSC. Deadline for registration is Dec. 7.

UH is offering graduate courses at the Clear Lake campus and interactive television classes on site this spring. Registration will be Wednesday in the Bldg. 45 lobby.

Applications are in Bldg. 45, Rm. 146, or Contact Beth Hall at x33078.